Production of in-house reference glass materials

For quantification of elements and chemical composition of materials, an external calibration standards are used. The number of commercially available standards with required concentration range is limited. A series of glasses with silicate matrix: SiO_2-Na_2O-CaO-Al_2O3-K_2O are prepared with additional elements such as Li, and other metals, rare earths, homogeneously distributed in the glass matrix.

Institution

FunGlass

FunGlass – Centre for Functional and Surface Functionalized Glass, Alexander Dubcek University of Trencin

Development Status

TRL3 / Proof-of-concept of critical functions and/or characteristics in laboratory

IP Protection Status

Patent pending

Partnering Strategy

licensing, collaboration, co-development

The Problem

The market for commercially available standards in "bulk" form covering the required concentration range is limited. These glasses cover the lithium concentration range found in strategic raw materials and have potential as reference material for direct elemental analyses such as laser ablation ICP-MS, EPMA, μXRF.

Technology Description

Silicate glass materials with elevated lithium content up to 12 wt.% Li_2O for direct elemental analyses are prepared by conventional melting. The elements of interest are homogeneously distributed in the glass matrix, with the spatial variation of their content not exceeding 5 relative %. The glass may further contain minor elements present in oxides selected from the group consisting of B_2O_3, Fe_2O_3, P_2O_5, TiO_2, Y_2O_3, ZrO_2, CuO or their combinations up to 5 wt.%, and Rb_2O, Sc_2O_3, Ga_2O_3, Ge_2O_3, Nb_2O_5, Ta_2O_5, Cs_2O, SnO, WO_3 or their combinations up to 3.5 wt.%.

Figure 1 shows an elemental map of calcium (A) and silicon (B) distribution, demonstrating the homogeneity of the prepared glass material, with a lithium content of 2 wt.%

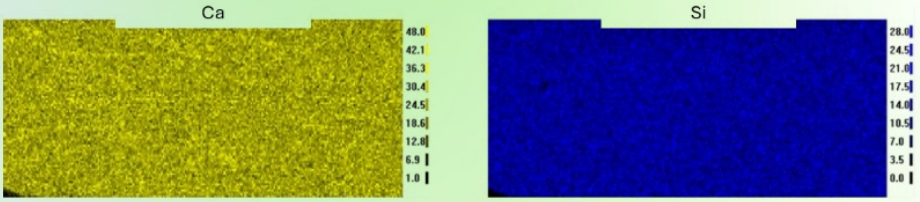
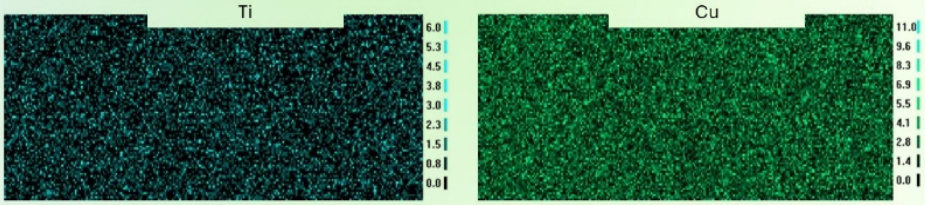


Figure 2 shows an elemental map of titanium (A) and copper (B) distribution, demonstrating the homogeneity of the prepared glass material, with a lithium content of 2 wt.%



Commercial Opportunity

Specific needs of end-users identified. Our customers are from academic, R&D centres, laboratories for material analysis and distributors of the analytical instruments.

GLACER HUB

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